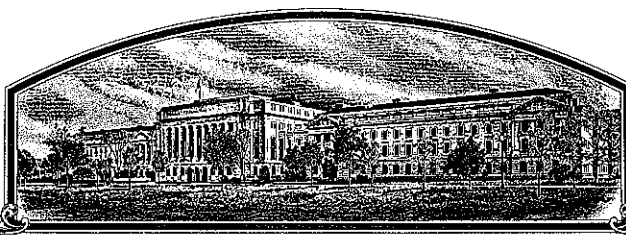


No.

9400151



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Western Plant Breeders, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Westford'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this *29th* day of *July* in the year of our Lord one thousand nine hundred and ninety-four.

Attest:

Kenneth H. Egan
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Mike Egan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Western Plant Breeders, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. BFP-79-18	3. VARIETY NAME Westford
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) 8111 Timberline Drive Bozeman, Montana 59715		5. PHONE (include area code) (406) 587-1218	
6. GENUS AND SPECIES NAME Hordeum vulgare		7. FAMILY NAME (Botanical) Gramineae	
8. CROP KIND NAME (Common Name) Barley		9. DATE OF DETERMINATION September 11, 1987	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Arizona		12. DATE OF INCORPORATION August 22, 1990	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Dr. Dale R. Clark Western Plant Breeders, Inc. 8111 Timberline Drive Bozeman, Montana 59715			
		PHONE (include area code): (406) 587-1218	
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety. b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement. c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety. d. <input type="checkbox"/> Exhibit D, Additional Description of Variety. e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership. f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office April 12, 1994 g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,325) made payable to "Treasurer of the United States." \$2,325 </div> <div style="width: 50%; font-size: small;"> 15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below) </div> </div>			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input checked="" type="checkbox"/> NO </div> <div> <input type="checkbox"/> Patent Act. Give date: _____ </div> </div>			
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES (If "YES," give names of countries and dates) U.S.A. 1993 April 20; AAH letter of 14 Apr 1994 <input type="checkbox"/> NO			
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT [Owner(s)] Dale R. Clark		CAPACITY OR TITLE Barley and Wheat Breeder	
SIGNATURE OF APPLICANT [Owner(s)]		DATE April 12, 1994	
SIGNATURE OF APPLICANT [Owner(s)]		DATE	

WESTFORD

14a. Breeding history:

Westford is a six-rowed, hooded hay barley that was developed from the cross of a Western Plant Breeders' population (Canadian Male Sterile Facilitated Recurrent Selection population) with the variety Stepford. The CMSFRS population originated by crossing the short strawed, six-rowed, male sterile population CCXXXII-76 with several six-rowed Canadian varieties. Stepford is a hooded, six-rowed spring barley derived from the cross Steptoe X Horsford.

Westford was selected as a single F2 plant at WPB's nursery near Conrad, Montana in 1978. Seed from the F2 plant was planted to produce an F3 plot near Conrad, MT in 1979. Six plants from the F3 plot were selected, designated the experimental number BFC-79-18, and planted near Phoenix, AZ in the fall of 1979. Seed from uniform F4 plots was bulked and put into yield tests near Conrad, MT in 1981. Successive generations of BFC-79-18 were grown near Conrad, MT in 1982 and near Bozeman, MT in 1986, 1987, and 1989. Approximately 100 spikes were selected from the F6 bulk in 1986 and planted as head rows near Bozeman, MT in the spring of 1987. Uniform head rows were harvested and bulked. This F7 bulk was planted near Bozeman, MT in the spring of 1988 to produce Breeders seed. The Breeders seed was harvested in the fall of 1988. This seed was used to plant 10 acres near Denton, MT in May of 1989. The resulting production was harvested as Foundation seed and designated "Westford". The Foundation seed was planted in May of 1990 to produce Registered seed. Registered seed was planted in 1991 to produce Certified seed and Certified seed was planted in 1992 to produce common seed. Common seed was first sold in April of 1993.

Westford is a stable and uniform variety in agronomic appearance and performance across several generations and growing conditions. Agronomic data to support this stability are presented in Tables 1 through 4.

WESTFORD

14b. Novelty Statement

Westford is most similar to the variety Horsford. However, Westford flowers 5 to 12 days later than Horsford, Westford is 0 to 7 inches taller than Horsford, and the spike of Westford is glossy where the spike of Horsford has a waxy coating.

The above comparison along with the complete objective description (14 c.) show Westford to be a novel variety of spring barley.

14e. Statement of ownership

Western Plant Breeders, Inc. is the employer of the breeder and rightfully therefore the owner of the variety "Westford".

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY (*HORDEUM VULGARE*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Western Plant Breeders

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

8111 Timberline Drive Bozeman, MT 59715

FOR OFFICIAL USE ONLY

PVPO NUMBER

9400151

VARIETY NAME OR TEMPORARY
DESIGNATION

Westford

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. or) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

 1 = SPRING 2 = FACULTATIVE WINTER 3 = WINTER Early Growth: 1 = PROSTRATE 2 = SEMIPROSTRATE
3 = ERECT

2. MATURITY (50% Flowering):

 1 = EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)

<input type="text" value="0"/>	No. of days Earlier than	<input type="text" value="8"/>	}	1 = BETZES	2 = CALIFORNIA MARIOUT	3 = CONQUEST	4 = DICKSON
<input type="text" value="8"/>	No. of days Later than	<input type="text" value="9"/>		5 = PIROLINE	6 = PRIMUS	7 = UNITAN	

3. PLANT HEIGHT (From soil level to top of head):

 1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes) 4 = TALL (Conquest)

<input type="text" value="0"/> <input type="text" value="0"/>	Cm. Shorter than	<input type="text" value="8"/>	}	1 = BETZES	2 = CALIFORNIA MARIOUT	3 = CONQUEST	4 = DICKSON
<input type="text" value="1"/> <input type="text" value="7"/>	Cm. Taller than	<input type="text" value="9"/>		5 = PIROLINE	6 = PRIMUS	7 = UNITAN	

4. STEM:

 Exertion (Flag to spike at maturity): 1 = 0 - 3 cm. 2 = 3 - 10 cm. Anthocyanin: 1 = ABSENT 2 = PRESENT
3 = 10 - 15 cm. NO. OF NODES (Originating from node above ground) Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN Shape of Neck: 1 = STRAIGHT 2 = SNAKY
4 = MODIFIED CLOSED OR OPEN 3 = OTHER (Specify)

5. LEAF:

 Basal leaf sheath (seedling): 1 = GLABROUS 2 = PUBESCENT Position of flag leaf (at boot stage): 1 = DROOPING
2 = UPRIGHT Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY MM. WIDTH (First leaf below flag leaf)
3 = WAXY CM. LENGTH (First leaf below flag leaf) Anthocyanin in leaf sheath: 1 = ABSENT 2 = PRESENT

6. HEAD:

 Type: 1 = TWO-ROWED 2 = SIX-ROWED Density: 1 = LAX 2 = ERECT (Not dense)
3 = ERECT (Dense) Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY
4 = OTHER (Specify) 3 = WAXY Lateral Kernels Overlap: 1 = NONE 2 = AT TIP Rachis (Hair on edge): 1 = LACKING 2 = FEW 3 = COVERED
3 = 1/4 - 1/2 OF HEAD

7. GLUME:

 Length: 1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA Hairs: 1 = NONE 2 = SHORT 3 = LONG
3 = MORE THAN 1/2 OF LEMMA Hair covering: 1 = NONE 2 = RESTRICTED TO MIDDLE 3 = CONFINED TO BAND 4 = COMPLETELY COVERED Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES
3 = MORE THAN EQUAL TO LENGTH OF GLUMES Awn Surface: 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

FORM GR-470-5 (Reverse)

8. LEMMA:

☐ 6 Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS AWNLESS ON LATERAL ROWS
 3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)
 5 = LONG (longer than spike) 6 = HOODED

☐ 0 Awn Surface: 0 = AWNLESS 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

☐ 2 Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS ☐ 1 Hair: 1 = ABSENT 2 = PRESENT

☐ 1 Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE 3 = TRANSVERSE CREASE ☐ 2 Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

☐ 2 Hairs: 1 = FEW 2 = MANY

10. SEED:

☐ 2 Type: 1 = NAKED 2 = COVERED ☐ 1 Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT

☐ 5 Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.)
 4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)

☐ 3 Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED

☐ 1 Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE

☐ 0 ☐ 4 PERCENT ABORTIVE ☐ 4 ☐ 5 GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> 0 SEPTORIA	<input type="checkbox"/> 2 NET BLOTCH	<input type="checkbox"/> 0 SPOT BLOTCH	<input type="checkbox"/> 1 POWDERY MILDEW
<input type="checkbox"/> 1 LOOSE SMUT	<input type="checkbox"/> 1 BACTERIAL BLIGHT	<input type="checkbox"/> 0 COVERED SMUT	<input type="checkbox"/> 1 FALSE LOOSE SMUT
<input type="checkbox"/> 0 STEM RUST	<input type="checkbox"/> 0 LEAF RUST	<input type="checkbox"/> 0 SCAB	<input type="checkbox"/> 2 SCALD
<input type="checkbox"/> 0 AY	<input type="checkbox"/> 0 BSMV	<input type="checkbox"/> 1 BYDV	<input type="checkbox"/> 0 OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible 2 = Resistant)

<input type="checkbox"/> 0 GREEN BUG	<input type="checkbox"/> 0 ENGLISH GRAIN APHID	<input type="checkbox"/> 0 CHINCH BUG	<input type="checkbox"/> 0 ARMYWORM
<input type="checkbox"/> 0 GRASS HOPPERS	<input type="checkbox"/> 0 CERIAL LEAF BETTLE	<input type="checkbox"/> 0 OTHER (Specify) _____	
HESSIAN FLY RACES		<input type="checkbox"/> 0 GP	<input type="checkbox"/> 0 A
		<input type="checkbox"/> 0 B	<input type="checkbox"/> 0 C
		<input type="checkbox"/> 0 D	<input type="checkbox"/> 0 E
		<input type="checkbox"/> 0 F	<input type="checkbox"/> 0 G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 DDT ☐ 0 OTHER (Specify) _____

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Horsford	Seed size	Steptoe
Leaf size	Horsford	Coleoptile elongation	Horsford
Leaf color	Gus	Seedling pigmentation	Gus
Leaf carriage	Horsford		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

1. Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
2. Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

WESTFORD

Table 1. Agronomic comparisons of Westford and Horsford grown in Western Plant Breeders' yield trials at Bozeman, MT.

	1987		1988		
	Plt. Ht. (inches)	Heading Date	Plt. Ht. (inches)	Heading Date	Lodging %
Westford	44	7/10	38	7/18	0
Horsford	37	7/04	33	7/06	80

WESTFORD

Table 2. Heading date (from Jan. 1) of Westford and Horsford in 1993
Montana State Univ. and Univ. of Wyoming trials.

<u>Location</u>	<u>Westford</u>	<u>Horsford</u>
Montana		
Moccasin	185	174
Sidney	180	170
Kalispell	188	177
Huntley (dry)	172	157
Huntley (irr)	169	157
Corvallis	185	176
Bozeman	<u>197</u>	<u>194</u>
mean	182	172
Wyoming		
Sheridan (dry)	181	172
Sheridan (irr)	<u>184</u>	<u>178</u>
mean	183	175
Grand mean	182	173

WESTFORD

Table 3. Plant height (in inches) of Westford and Horsford in 1993
Montana State Univ. trials.

<u>Location</u>	<u>Westford</u>	<u>Horsford</u>
Montana		
Moccasin ¹	34	30
Moccasin ²	35	31
Sidney	39	40
Kalispell	45	43
Corvallis	31	33
Bozeman	<u>46</u>	<u>44</u>
mean	38.3	36.8

WESTFORD

Table 4. Forage dry matter yield (in tons per acre) of Westford and Horsford in 1993 Montana State Univ. and Univ. of Wyoming trials.

<u>Location</u>	<u>Westford</u>	<u>Horsford</u>
Montana		
Moccasin ¹	2.41	1.85
Moccasin ²	3.05	2.95
Sidney	4.33	3.93
Kalispell	4.03	2.64
Huntley (dry)	1.27	0.87
Huntley (irr)	1.85	1.28
Corvallis	4.74	3.05
Bozeman	<u>2.00</u>	<u>1.80</u>
mean	2.96	2.30
Wyoming		
Sheridan (dry)	1.66	1.54
Sheridan (irr)	<u>3.15</u>	<u>2.16</u>
mean	2.41	1.85
Grand mean	2.85	2.21

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